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Onn Haran

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EXAMINER

CEHIC, KENAN

ART UNIT

PAPER NUMBER

2616

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,505	Applicant(s) HARAN ET AL.	
	Examiner KENAN CEHIC	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 16-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/22/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-16 in the reply filed on 12/26/2007 is acknowledged.

Specification

2. The disclosure is objected to because of the following informalities:

The description of Figure 5, throughout page 7 second paragraph ("In the first stage...") through page 9 first paragraph do not match to what is depicted in figure 5. For example page 7 lines 12-15 "...is checked. If....does not fit...execution continues in step 518", the applicant omits the steps between 512 and 518; or on page 7 line 31 the specification states "comparison checks in steps 508, 510, 512", while figure 5 does not show any comparison in boxes 508, 510, 512. The description of figure 5 must match what is depicted in figure 5.

Appropriate correction is required.

Claim Objections

3. Claim 7-9, 14-15 is objected to because of the following informalities:

Claim 7 has an improper dependency. For examination purposes it is assumed that claim 7 depends on claim 6.

For claim 14, "said ungranted packet" in line 3 is the first occurrence of a single ungranted packet. It is suggested to change this to --an ungranted packet--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(e) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Kramer et al. (US 6,546,014)

For claim 1, Kramer discloses in a passive optical network (PON) (see fig 2; 202 and col 2 lines 20-40 “PON”) a method for transmitting packets (see col 5 lines 1-14 “frames...IP packets” and fig. 8 ONU-1 through ONU-3 TX) by an optical network unit (ONU) (see fig 2; ONU-1 through ONU-3) comprising the steps of:

receiving a grant (see fig 12; 1206, 1208 and col 6 line 66 through col 7 lines 20

“GRANT message....received by the ONU-1....receiving the GRANT message...”)

having a grant length (see col 6 lines 66 through col 7 lines 20 “1200 bytes” and col 7 lines 35-45 “OLT has authorized the ONU-1 to send a specific number of bytes by the

GRANT message”) from an optical line terminal (OLT) (see fig 2; 204 and col 6 line 66 through col 7 lines 20 “OLT...transmits an ONU control message....message...referred to herein as a GRANT message”) of the PON (see fig 2; 202 and col 2 lines 20-40 “PON”); and based on said grant (see fig 12; 1206, 1208 and col 6 line 66 through col 7 lines 20 “GRANT message....received by the ONU-1....receiving the GRANT message...” and col 8 lines 21-39 “granted window size”), calculating an ONU packet egress order (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) that eliminates packet fragmentation (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 2616

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) in view of Shi et al. (US 2003/0179769).

For claim 2, Kramer discloses the claimed invention as described in paragraph 4.

For claim 3, Kramer further discloses step of calculating (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) is preceded by a step of handling out of band information (see col 8 lines 10-40 “updated entry for the ONU-1 can be computed as follows:...updated entry.....situations when the granted window size is not fully filled by the data from an ONU”);

For claim 3, Kramer further discloses checking (see col 8 lines 10-40 “updated_entry...high priority packet....leaving remaining amount of data in the buffer....updated_entry”) said buffer (see fig 2; 212) for

ungranted packets (see col 8 lines 10-40 “updated_entry...high priority packet....leaving remaining amount of data in the buffer....updated_entry”), and wherein said step of calculating (see col 8 lines 10-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) includes performing a three stage test (see col 8 lines 10-39 “higher-priority....variable lengths, may not exactly fill the granted window size.....If packet fragmentation is not available” and col 8 line 64-25 “grant size...is zero bytes...entryis zero....grant message is zero”) on each of said ungranted packets (see col 8 lines 10-40 “updated_entry...high priority packet....leaving remaining amount of data in the buffer....updated_entry”), each of said stage tests involving a stage variable test (see col 8 lines 10-39 “higher-priority....may not exactly fill the granted window size.....If packet fragmentation is not available” and col 8 line 64-25 “grant size...is zero bytes...entryis zero....grant message is zero”).

For claim 4, stage variable is selected from the group consisting of reported bytes below threshold (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8 line 64-25 “grant size...is zero bytes...entryis zero....grant message is zero”), and wherein said performing of a stage test (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8 line 64-25 “grant size...is zero bytes...entryis zero....grant message is zero”) involving a stage variable (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8 line 64-25 “grant size...is zero bytes...entryis zero....grant message is zero”) includes comparing a value of said stage variable to zero

(see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8 line 64-25 “grant size...is zero bytes...entryis zero....grant message is zero”; comparing if difference between variable lengths and granted window size is zero).

For claim 5, Kramer discloses said ungranted packet is marked as granted (see col 12-25 “number of bytes...when the REQUEST message was sent,is used by the OLT to update the polling table.... $4300-1200=3100$ ”), if the result of said comparison (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”) is that said value of said stage variable (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”) is greater than zero (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”).

For claim 6, Kramer discloses grant is a flexible grant set by said OLT (see col 8 line 64-15 “entry is zero...request ...congaing the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 15 “authorizes...to send 1200 bytes....” and fig 8 ; OLT TX....1200 1.....400 2....2500 3; grants sent by OLT) based on information received from the ONU (see col 8 line 64-15 “entry is zero...request ...congaing the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 45“authorizes...to send 1200 bytes....REQUEST message” and col 2 lines 40-57 “request message...updated information about the current ize of the data...updating the table...Each grant message is indicatiave....amount...dependent on the information included...in the table” and fig 8 ; OLT TX....1200 1.....400 2....2500 3; grants sent by OLT).

For claim 7, Kramer discloses information includes a combination of values of bytes below threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") and total bytes (see col 8 lines 22-45 "bytes received").

For claim 8, said threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") is adaptive (fig 8 ; OLT TX....1200 1.....400 2....2500 3; and col 7 lines 1-15 "size of granted window" grants sent by OLT).

For claim 9, Kramer discloses said values of bytes below threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") and total bytes (see col 8 lines 22-45 "bytes received").

Kramer is silent about:

For claim 2, includes handling a sub-queue of a given priority.

For claim 3, sub-queue.

For claim 9, accumulated from highest to lowest priority.

Shi from the same or similar field of endeavor discloses a communication network with the following features:

For claim 2, Shi discloses includes handling a sub-queue (see fig 21 "queues" and section 0145 "queues") of a given priority (see section 0125 "Weighted Round Robin" and fig 21 "WRR").

For claim 3, Shi discloses a sub-queue (see fig 21 “queues” and section 0145 “queues”).

For claim 9, Shi discloses accumulated from highest to lowest priority (see section 0088-0089 “bigger weight....weight giving to each ONU” and section 00125 “Weighted Round Robin....scheduler....schedule the queues”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer by using the features, as taught by Shi, in order to eliminate having an ONU wait for the duration of multiple frames after a transmission and before it can transmit again, thereby to eliminate the related delay variation and/or jitter, which has benefits in voice quality delivery (see section 0019-0022)

6. Claim 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) in view of Shi et al. (US 2003/0179769).

For claim 10, Kramer discloses In a passive optical network (PON) (see fig 2; 202 and col 2 lines 20-40 “PON”), a method for eliminating packet fragmentation (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) comprising the steps of: providing an optical line terminal (OLT) (see fig 2; 204) connected (see fig 2; 228,226,230,232,234) to a plurality of optical network units (ONUs) (see fig 2 ONU-1 through ONU-3), each of said ONUs transmitting packets (see col 5 lines 1-14 “frames...IP packets” and fig. 8 ONU-1 through ONU-3 TX) arranged in a buffer (see fig 2; 212) having a total byte length (see fig 3 ; 302; col 6 line 66 through col 7 “1200 bytes of data that is currently in the buffer

212” and col 7 lines 15-31 “4300 bytes of data are currently waiting in the buffer”), said packets transmitted (see col 5 lines 1-14 “frames...IP packets” and fig. 8 ONU-1 through ONU-3 TX) in response (see col 2 lines 41-55 “to be transmitted at the ...in response to the grant messages” and to a grant received from said OLT (see fig 2; 204 and col 6 line 66 through col 7 lines 20 “OLT...transmits an ONU control message....message...referred to herein as a GRANT message”), said grant having a grant length (see col 6 lines 66 through col 7 lines 20 “1200 bytes” and col 7 lines 35-45 “OLT has authorized the ONU-1 to send a specific number of bytes by the GRANT message”); and matching said total byte length with said grant length (col 6 line 66 through col 7 “control messageauthorizes the ONU 1 to send 1200 bytes of data that is currently in the buffer 212”), whereby the fragmentation loss is eliminated (see col 6 line 66 through col 7 “control messageauthorizes the ONU 1 to send 1200 bytes of data that is currently in the buffer 212” and col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”).

For claim 11, Kramer discloses matching (col 6 line 66 through col 7 “control messageauthorizes the ONU 1 to send 1200 bytes of data that is currently in the buffer 212”) includes hiding (col 8 lines 10-40 “updated entry for the ONU-1 can be computed as follows:...updated entry=...bytes_received”) , by each said ONU (see fig 2; ONU-1 through ONU-3), an update in a queue status (col 8 lines 10-40 “updated entry for the ONU-1 can be computed as follows:...updated entry=...bytes_received”; bytes received used instead of bytes in queue) from said OLT (see fig 2; 204).

For claim 12, Kramer discloses said hiding (col 8 lines 10-40 “updated entry for the ONU-1 can be computed as follows:...updated entry=...bytes_received”) includes freezing a transmission order (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) of queues (see fig 2; 212).

Kramer is silent about:

As regarding claim 10, sub-queues.

Shi from the same or similar field of endeavor discloses a communication system with the following features:

As regarding claim 10, Shi discloses sub-queues (see fig 21 “queues” and section 0145 “queues”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer by using the features, as taught by Shi, in order to eliminate having an ONU wait for the duration of multiple frames after a transmission and before it can transmit again, thereby to eliminate the related delay variation and/or jitter, which has benefits in voice quality delivery (see section 0019-0022)

7. Claim 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) in view of Shi et al. (US 2003/0179769) as applied about to claim 11, further in view of Wellen (US 2002/0075884).

For claim 13, Kramer and Shi discloses the claimed invention as described in paragraph 6.

For claim 13, Kramer further discloses step of matching (col 6 line 66 through col 7

“control messageauthorizes the ONU 1 to send 1200 bytes of data that is currently in the buffer 212”).

For claim 14, Kramer discloses marking includes comparing to zero (see col 8 line 64-15

“entry is zero...request ...containg the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 45“authorizes...to send 1200

bytes....REQUEST message" and col 2 lines 40-57 “request message...updated

information about the current ize of the data...updating the table...Each grant message is indicatiave....amount...dependent on the information included...in the table” and fig 8 ;

OLT TX....1200 1.....400 2....2500 3; grants sent by OLT) a stage variable selected from the group reported total bytes (see col 8 line 64-15 “entry is zero...request ...containg the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line

55- col 7 line 15 “authorizes...to send 1200 bytes...." and fig 8 ; OLT TX....1200 1.....400 2....2500 3; grants sent by OLT), and marking said ungranted packet as granted (see col 8

line 64-15 “entry is zero...request ...cotaining the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 45“authorizes...to send

1200 bytes....REQUEST message" and col 2 lines 40-57 “request message...updated

information about the current size of the data...updating the table...Each grant message is indicatiave....amount...dependent on the information included...in the table” and fig 8

; OLT TX....1200 1.....400 2....2500 3; grants sent by OLT) if said stage variable is greater than zero (see col 8 line 64-15 “entry is zero...request ...containing the last

number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55-

col 7 line 45“authorizes...to send 1200 bytes....REQUEST message" and col 2 lines 40-57 “request message...updated information about the current size of the data...updating the table...Each grant message is indicative....amount...dependent on the information included...in the table” and fig 8 ; OLT TX....1200 1.....400 2....2500 3; grants sent by OLT).

For claim 15, Kramer discloses said marking (see col 8 line 64-15 “entry is zero...request ...containing the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 45“authorizes...to send 1200 bytes....REQUEST message" and col 2 lines 40-57 “request message...updated information about the current size of the data...updating the table...Each grant message is indicative....amount...dependent on the information included...in the table” and fig 8 ; OLT TX....1200 1.....400 2....2500 3; grants sent by OLT) is followed by removing said ungranted and marked packet length (see col 8 lines 5-45 “updated entry....new_entry-old_entry=4300-1200 = 3100 bytes.....updated_entry=new_entry-bytes_received”) from reported and current variables (see col 8 lines 5-45 “updated entry....new_entry-old_entry=4300-1200 = 3100 bytes.....updated_entry=new_entry-bytes_received”).

Kramer and Chi are silent about:

For claim 13, includes checking from highest to lowest priority each of said sub-queues, identifying in each said sub-queue ungranted packets with respective ungranted packet lengths, and marking each said ungranted packet as about to be transmitted.

For claim 14, marking includes comparing to zero a stage variable selected from the group of reported bytes below threshold, reported total bytes, and total bytes, and marking said ungranted packet as granted if said stage variable is greater than zero.

Wellen from the same or similar field of endeavor discloses a communication network with the following features:

For claim 13, Wellen discloses includes checking from highest to lowest priority each of said sub-queues (see section 0009-14 “comparing request applies a comparison of the priority levels....associated with the higher priority request...higher priority...highest priority...” and section 0031-34 “higher priority data packet ...lower priority data packets....Scheduling of the different queue priorities”), identifying in each said sub-queue ungranted packets (see section 0030-33 “data packets at the output ports....queueing of the data packets is performed....data packets with different priority”) with respective ungranted packet lengths (section 0031-34 “higher priority data packet ...lower priority data packets....Scheduling of the different queue priorities”), and marking (see section 0031-33 “granted permission...send...associated data packet”) each said ungranted packet as about to be transmitted (see section 0031-33 “granted permission...send...associated data packet”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer and Shi by using the features, as taught by Wellen, in order to provide a scheduling method that can schedule a large number of queues according to their priorities, so that Quality of service can be provided to certain traffic (see sections 0005-0015).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US-6,229,788 B1	05-2001	Graves et al.	370/230
US-6,519,255 B1	02-2003	Graves, Alan F.	370/392
US-2003/0137975 A1	07-2003	Song et al.	370/353
US-6,636,527 B1	10-2003	Lee et al.	370/465
US-6,735,211 B1	05-2004	Karasawa, Satoru	370/412
US-6,804,256 B2	10-2004	Chang, Tsung-Shien	370/468
US-7,263,101 B2	08-2007	Kim et al.	370/395.64

The above are recited to show system of queuing and priority associated with PON networks.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENAN CEHIC whose telephone number is (571)270-3120.

The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KC

/Kwang B. Yao/
Supervisory Patent Examiner, Art Unit 2616